



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,769	07/31/2006	Edward Ludovicus Koper	10690/011	3617

27879 7590 08/26/2009
INDIANAPOLIS OFFICE 27879
BRINKS HOFER GILSON & LIONE
CAPITAL CENTER, SUITE 1100
201 NORTH ILLINOIS STREET
INDIANAPOLIS, IN 46204-4220

EXAMINER

MCCAIG, BRIAN A

ART UNIT	PAPER NUMBER
----------	--------------

1797

MAIL DATE	DELIVERY MODE
-----------	---------------

08/26/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/549,769	Applicant(s) KOPER ET AL.	
	Examiner BRIAN MCCAIG	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is the initial Office action based on the 10/549769 application filed September 9, 2005.
2. Claims 30-59 are pending and have been fully considered.
3. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) as follows: The application fails to provide a reference to the prior applications either in the first sentence of the specification or in an application data sheet.

Claim Rejections - 35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 30, 32-40, and 54-59 are rejected under 35 U.S.C. 103(a) as obvious over O'REAR ET AL (WO 01/64610 A1), hereafter referred to as O'REAR.**
5. With respect to claims 30 and 32-34, O'REAR discloses a process for producing linear alkyl benzene, the process including the steps of obtaining a hydrocarbon condensate containing olefins, paraffins and oxygenates

Art Unit: 1797

from a low temperature Fischer-Tropsch (F-T) reaction using a cobalt catalyst [page 2, lines 11-13; page 4, lines 15-23; page 8, line 9] and

- a. fractionating a desired carbon number distribution from the hydrocarbon condensate to form a fractionated hydrocarbon condensate stream which is the product of a Fischer-Tropsch reaction [page 13, line 22 to page 14, line 5];
 - b. extracting oxygenates from the fractionated hydrocarbon condensate stream from step (a) to form a stream containing olefins and paraffins which is the product of a Fischer-Tropsch reaction [page 2, lines 14-16];
 - c. alkylating olefins in the combined stream from step (b) with benzene in the presence of a suitable alkylation catalyst in an alkylation reactor [page 29, line 30 to page 33, line 31]; and
 - d. recovering linear alkyl benzene from the alkylation reactor [page 33, line 26].
6. Furthermore, O'REAR discloses that the F-T reaction is carried in a slurry bed reactor at a temperature of 160-280° C (and, more particularly, 210-260° C) and in the presence of a cobalt catalyst to provide a hydrocarbon condensate [page 11, lines 7-12], which is substantially the same as the process to obtain the F-T condensate in the instant application.
7. With respect to claims 32-33 and 35, O'REAR does not appear to explicitly disclose that the hydrocarbon condensate contains 60 to 80% by weight paraffins and 10 to 30% by weight olefins, and, more particularly, less than 25% by weight. However, it is expected that such a requirement is inherent in the invention of O'REAR since the

Art Unit: 1797

feed, the reaction conditions [page 11, lines 7-19], reaction vessel (slurry reactor), and catalyst (cobalt on an alumina support) are similar to those disclosed in the instant application.

8. Alternatively, it would have been obvious to one of ordinary skill in the art to modify any of the aforementioned variables to obtain a hydrocarbon condensate containing 60 to 80% by weight paraffins and 10 to 30% by weight olefins, and, more particularly, less than 25% by weight olefins, because the feed, reaction conditions, reaction vessel, and catalyst of O'REAR are similar to those disclosed in the instant application, and it has been held that the provision of adjustability of variables or parameters, where needed, involves routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA 1954).

9. With respect to claims 36-37, O'REAR does not appear to explicitly disclose that the olefins in the hydrocarbon condensate have the required linearity. However, it is expected that such a requirement is inherent in the invention of O'REAR since the feed, the reaction conditions, reaction vessel, and catalyst are similar to those disclosed in the instant application.

10. Alternatively, since the reaction conditions, reaction vessel, and catalyst of O'REAR are similar to those disclosed in the instant application, it would have been obvious to one of ordinary skill in the art to modify any of the aforementioned variables to obtain a hydrocarbon condensate with the required linearity, since it has been held that the provision of adjustability of variables or parameters, where needed, involves routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA 1954).

Art Unit: 1797

11. With respect to claims 38-40 and 55-57, O'REAR discloses that the hydrocarbon condensate is fractionated in step a) into the C₉-C₂₆ range [page 15, paragraph 1 & page 30, paragraph 1]. O'REAR does not appear to explicitly disclose that the fractionated hydrocarbon product contains 10 to 30% by weight olefins with a degree of linearity greater than 92%. However, as previously discussed, it is expected that such a requirement is inherent in the invention of O'REAR since the feed, reaction conditions, reaction vessel, and catalyst are similar to those disclosed in the instant application.

12. Alternatively, since the feed, reaction conditions, reaction vessel, and catalyst of O'REAR are similar to those disclosed in the instant application, it would have been obvious to one of ordinary skill in the art to modify any of the aforementioned variables to obtain a hydrocarbon condensate with the required linearity and olefin concentration, since it has been held that the provision of adjustability of variables or parameters, where needed, involves routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA 1954).

13. With respect to claim 54, O'REAR discloses that an example of an alkylation reaction that can be used in the process disclosed above is the UOP Detal process [claim 13], which uses a solid acid catalyst. Similarly, O'REAR teaches the same catalysts as disclosed in the instant application [see page 33, lines 1-5].

14. With respect to claims 58 and 59, O'REAR does not appear to the degree of linearity. However, it is expected that the required limitations are inherent to the process since the reaction feeds and processes are the same (e.g., both may be a UOP Detal process).

Art Unit: 1797

15. **Claims 31 and 41-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'REAR ET AL (WO 01/64610 A1) as applied to claims 46, 48-57, and 71 above and in further view of BECKER (DE 19911910 A1) and DE WET ET AL (WO 02/31085 A2), hereafter referred to as O'REAR, BECKER, and DE WET, respectively.**

16. Since BECKER is equivalent to the Republic of South Africa application No. 2000129, which is in the English translation, the Examiner will reference that application as the disclosure of the DE 19911910 A1 patent.

17. With respect to claims 47, 58-61, and 64-70, O'REAR discloses that the hydrocarbon condensate is treated by extraction to remove oxygenates and other by-products of a F-T synthesis. O'REAR does not appear to explicitly disclose that a light solvent comprising methanol and water is used in the extraction; that the water concentration is more than 3% by weight, more particularly between 5 and 15% by weight; the concentration of olefins and paraffins and oxygenates in the feed and exit streams to a stripper column, recovery rates of olefins and paraffins, or that the olefin/paraffin ratio is preserved in the extraction.

18. However, BECKER, which is concerned with a process for separating oxygenates from a hydrocarbon flow, discloses a liquid/liquid extraction process using a light solvent comprised of methanol and water [page 1, paragraph 1 & page 2, paragraph 5]. BECKER does not appear to explicitly disclose that the water concentration in the light solvent is more than 3% by weight, and more particularly between 5 and 15% by weight.

Art Unit: 1797

19. However, DE WET, which is concerned with the separation of oxygenates from hydrocarbons, discloses an extraction system using a light polar solvent, although not specifically methanol, comprising water in a concentration less than 19%.

20. At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified the process of BECKER with the solvent content of DE WET because such an amount is effective in the extracting process. Furthermore, it would have been obvious to one of ordinary skill in the art to modify the process of DE WET with the solvent components of BECKER including methanol because the solvents are inert relative to the oxygenates, thermally stable, have a sufficiently low freezing point, and have negligible affect on utility of the product as explained by BECKER [page 2, paragraph 7]. Additionally, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the process of O'REAR with the extraction process of modified BECKER because the process is simple and removes oxygenates from the largest possible spectrum of hydrocarbons as disclosed by BECKER [page 2, paragraph 3]. Alternatively, it would have been obvious to one of ordinary skill in the art to modify the process of O'REAR with the extraction process of modified DE WET since O'REAR discloses the necessity of separating oxygenates from a hydrocarbon condensate [page 2, lines 14-16] and DE WET is an obvious choice since the hydrocarbons fractions being separated are similar to that of O'REAR [page 5, paragraph 5 of DE WET] and the hydrocarbons and oxygenates are formed under similar F-T conditions [page 1, paragraph 2 of DE WET].

Art Unit: 1797

21. None of the prior art references appear to explicitly disclose the concentration of olefins/paraffins and oxygenates in the feed and exit streams to a stripper column, recovery rates of olefins and paraffins, or the preservation of the olefin/paraffin ratio in the extraction process. However, it is expected that the process of modified O'REAR has the required limitations since the F-T feedstock and extraction process is similar to that disclosed in the instant application. That is, since the extraction process of modified BECKER is essentially the same as the claimed process (similar solvents, similar F-T hydrocarbon fractions, and similar solvent to feed ratios) , it is expected that the concentration of olefins/paraffins and oxygenates in the feed and exit streams to a stripper column, the recovery rates of olefins and paraffins, and the olefin/paraffin ratio will meet the limitations recited in the instant application.

22. With respect to claims 62 and 63, reference is made to the preceding discussion of modified O'REAR. In addition, DE WET discloses that the tops product from a solvent recovery column comprising a polar solvent (in this case, the methanol/water combination of modified DE WET) and olefins/paraffins is recycled back to the extraction column [reference element 40, figure 1; page 8, paragraph 1].

23. Similarly, BECKER discloses that the tops product (gas flow) from a solvent regeneration column [reference element 9, figure 3] comprising a polar solvent and olefins/paraffins is recycled back to the extraction column [via reference elements 2, 12, 14, and 16 in figure 3; page 6, paragraph 3 to page 7, paragraph 1]. Furthermore, since the gas flow [reference element 12, figure 3] contains solvent and hydrocarbons, which is recycled to the extraction column, it is also analogous to the bottoms product of

Art Unit: 1797

the solvent recovery column in the instant application. While there may be a slight difference in the operating conditions of the solvent recovery column between BECKER and the instant application, the applicant is reminded that if the prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. *In re King*, 231 USPQ 136. In this case, the claim requires recycling a distillation bottoms product comprising water, oxygenate, and olefins/paraffins of which most of the olefins/paraffins and oxygenates are subsequently decanted leaving water (solvent) to be recycled. BECKER discloses a gas flow comprising solvent gas comprising water and hydrocarbons (olefins/paraffins), which are subsequently decanted leaving the solvent gas comprising water to be recycled.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN MCCAIG whose telephone number is (571) 270-5548. The examiner can normally be reached on M-F 8-430.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BAM
8/19/2009

/ROBERT J. HILL, JR/
Primary Examiner, Art Unit 1797